

Marine Skill Report Submitted to the University of Hawaii,
Marine Options Program.

Marine Education Internship:
Acquisition of skill in marine transportation of petroleum and chemical products.

Duration of the Internship:
December 1, 1978 - August 20, 1979

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Symbols used:

[] - refers to footnote.

* - refers to appendix for more information.

Explanation of internship.

My marine skill is defined by my experiences as a tankerman and chemical handler onboard the oceangoing tanker, Francis S. Bushey.

*1

My reasons for doing it vary from my desire for adventure, excitement, and danger to gaining an insight into the marine industry, understanding transportation on the sea, and helping me in my academic education by the practical education offered in the experience. I should mention that the academic degree I am pursuing is Marine Geography, where transportation on the sea is an important aspect. Finally, going to sea upheld the tradition of my seafaring heritage.

The first step, in achieving my goal, was to obtain seaman's papers which gave me a license to sail and man merchant vessels under the United States flag. The process is simple and tough at the same time in that to get the license, a company has to write a letter to the United States Coast Guard asking them to give you the license as the company needs you to operate one of their vessels. Once you have the letter, you go to the Coast Guard and file for the license. After half an hour of red tape (forms, etc.) the license is issued and it is good for life. The difficult part is in getting a company to write the letter. The reason being that unions dominate the industry and manning of vessels and companies do not want a conflict with them because of non-union men. Also, companies want to benefit by hiring you and utilizing your services. Many times they are used by individuals who need the letter but do not want to work for the company. Usually, and this was true for me also, if you know someone it helps--I'll be the first to admit it. Once this was cleared and I was in, it was a matter of going to work.

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[1]

[1] - This was the usual time it took at the United States Coast Guard, Division of Licensing, Battery Place, New York, N.Y.

My expectations were that the work would teach me about the shipping industry and give a good understanding and enlightenment of what really goes on. With my academic education, this would make me an informed individual in the field of Marine Geography.

Now the work and training started. The training period is rather short in the sense that as soon as you began, you were considered part of the team and supposedly qualified. The word training will basically refer to the gaining of skills and mastering of those skills. Learning how to control operations and be responsible for actions executed are part of the definition of training as the stakes are high and dangerous. The acquisition of the Tankermans Certificate (which includes chemical handling, and is a separate license from the seaman's papers) is considered part of the training process and successful completion of the training process.

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My job was to load and unload the vessel of her cargo in a safe and proper fashion that followed the guidelines set by the Department of Transportation, United States Coast Guard, National Oceanographic and Atmospheric Administration, Environmental Protection Agency, and the vessel's Manual of Operation. Many of the rules and regulations set by these agencies are found in the Tankermans Manual. The Tankermans Manual is one of the texts you must study, in order to go before the Coast Guard and take the written examination given in chemical handling. If you successfully pass this exam, you are issued the Tankermans Certificate.

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Loading Operations

Loading operations consisted of the following steps:

- 1) Securely mooring the vessel in her berth.
- 2) Grounding the vessel (electrical grounding).
- 3) Signing of transfer documents.
- 4) Making cargo hose connection to shore facility.
- 5) Setting tanks to be loaded open.

- 6) Setting valves in open or closed position depending on way the vessel is to be loaded.
- 7) Establish communications with shore facility in case of emergencies.
- 8) Initiate loading of cargo.
- 9) Observing and regulating the loading of cargo at all times.
- 10) Controlling "topping off" process.
- 11) Shutting down at agreed amount of load or when full.
- 12) Disconnecting when finished and readying vessel for sea.

Specific techniques involved were the setting of valves and lines through which the cargo was loaded so as to maintain a stable vessel and the "topping off" process. I will first explain the loading procedures and then "topping off". Securing the vessel simply means tying the vessel as close to the dock as possible and that the vessel is lined up properly with the shore connection for loading. Grounding the vessel means establishing an equilibrium of static electricity between the vessel and the shore so there is no flow of electricity to produce a charge or spark. Transfer documents are agreements as to cargo, amount of cargo, readiness of vessel to load, and that the vessel is in compliance with proper operating procedures. This same agreement applies for the shore facility and its operation. Making the connection is the process of taking one of the vessel's cargo hoses and securely connecting it to the pipeline connection on shore. All other procedures should be self-explanatory. [2],*6

"Topping Off"

"Topping off" is a process where, not to risk spills, you load the tanks

[2] - lines: are pipelines that are huge in diameter for containing cargo as it flows through.

one at a time when they are near the stipulated level of load or full capacity. I mentioned earlier that setting valves and lines was a specific technique and this is where it would conclude as "topping off" begins. When loading was first started, all the valves would be open so as to allow the cargo to enter all tanks evenly but, as often was the case, the vessel would develop a list to one side and it would have to be corrected, fast! You did this by slowing down the flow of cargo to the listing side until the other side had gained the same level of cargo and the vessel was stable again. Sometimes you had to totally shut the side down and let the other side catch up. All this slowing down of flow or stopping of flow was done through the regulating of valves. The valves in turn blocked the lines. In "topping off" valves are also involved but, in this case, only the tank being filled is being regulated and you are not worrying about stability. Prior to "topping off" every tank had been filled to five feet below the full amount level of cargo to be carried. In other words you had five feet to go until full. You then started "topping off" in the aftermost tank (tank closest to the stern) by reopening that tank and letting it fill to the load level. After completely shutting the tank down, you moved forward to the next one and filled it the same way. This process is continued in that sequential forward tank filling process until the vessel is fully loaded. This technique provided a safe, controlled loading operation where the risk of spills and danger was minimized. You didn't have^{to} worry about everything else and end up running around recklessly trying to control the whole loading operation. It is physically impossible.

Unloading Operations

Unloading operations consisted of the following steps:

- 1) Securely mooring the vessel in her berth.
- 2) Grounding the vessel (electrical grounding).
- 3) Signing of transfer documents.
- 4) Making cargo hose connection to shore facility.

- 5)Setting valves in open position depending on how vessel is to be unloaded.
- 6)Establishing communications with shore facility.
- 7)Starting pumps (warm-up of pumps).
- 8)Engaging pumps when shore facility is ready to receive cargo.
- 9)Opening tanks for unloading of cargo (usually opened only one first to make sure pump has suction).
- 10)Observing and regulating unloading at all times.
- 11)Successfully "stripping out" the vessel.
- 12)Shutdown and disconnection.

Since many of the above steps have been previously defined or are self-explaining I will not define the unloading process except for "stripping out" as it is the most important and the most complicated technique there is on a tanker.

"Stripping Out"

"Stripping out" is the successful emptying of the vessel without losing the suction or having cargo remain. Though this might not sound tough, it is the most difficult and frustrating process there is. Basically, what you do is that when the vessel is almost empty you will open a smaller line known as the "stripping line". Through this you will suck the remaining cargo out of the tank and pump it ashore. You cannot use the large line as there isn't enough cargo to fill it completely and provide a suction strong enough for the pump to function. A small line is more easily filled and less likely to develop vacuum pockets or get air in it. You will do this with each tank (one at a time in sequence) until all are empty. The reason for one at a time is so that you can, initially, synchronize the cutting in of the "stripping line" on the big line without losing the suction. This is an important moment. This is done utilizing a previous mentioned technique of regulating valves and lines. The more basic reason is the inability of a tankerman to be everywhere at once, and this is one process that must be successful. In other words don't lose the suction.

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If you do lose the suction, and the pumps are airborne, there is no way to regain the suction legitimately. The reason is that the tanks are almost empty and therefore you have no source of primer to reobtain the suction on the pump. It can be done by feeding seawater from under the vessel but this causes contamination of the cargo and is illegal. This process known as "stripping out" is undoubtedly one of the most crucial aspects of a tankerman's job. Also, as far as the vessel is concerned, it is important because they get charged for the remaining cargo. The reason is that part of the cargo was not delivered. In addition, cleaning expenses are incurred for cleaning services to remove the left-over cargo so the vessel can receive its next cargo.

This concludes my basic job and internship as a tankerman. I would like to define, in more specific terms, the risks and dangers involved, types of cargo (that we carried), and supervision.

Risks, Cargoes, and Supervision.

The risks and responsibilities of the job are enormous. In loading, if you do not control the "topping off" process, a spill can occur and that is a punishable offense. If you do not control the valves and lines and pressure builds, an explosion is a popular consequence. The handling of the cargo hose can be painful as I found out. Many times there is cargo left in the hose and when the hose is disconnected, it comes pouring out. If you are in the way, you can get burned badly by the cargo. I was soaked with gasoline which burned my skin and irritated me for several days. Even worse is heptene which can cause burns so bad that hospitalization is required. Unfortunately, this is part of the job. Also, many cargoes are toxic and inhalation of the fumes can kill you. The last hazard is what I call the "freak quotient" which is when a disaster occurs by a freak incident such as a glowing ember from a cigarette, airplane engine, or factory comes drifting through the air and comes in contact with the fumes given off by the cargo. The next thing

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is an explosion. The Francis S. Bushey has blown up twice from undetermined causes. Static electricity is another hazard that can have fatal results. The flow of cargo, engine operation, or pumps can produce a sufficient charge that can ignite the cargo. If temperature and humidity are just right, spontaneous combustion can occur. What next? Well, I'll leave that up to your imagination, as I wouldn't be here to tell you.

While working on the Francis S. Bushey, I came in contact with five different cargoes. The first was Naphta which is a synthetic gas used for producing chemicals and chemical byproducts such as glues, cleaning solvents, and paint thinners. Naphta is a highly explosive petroleum product that releases deadly fumes. Heptene was another of the highly explosive cargoes. Heptene is a chemical used in making plastics and it is the second most explosive cargo, carried by tankers, next to LNG (Liquified Natural Gas). Oil was the third most carried cargo but compared to the above, it was considered harmless. Oil is used in heating homes, producing electricity, and lubrication purposes such as in a car. Gasoline was another popular cargo especially with the gas crisis of early '79. Gasoline is another of the explosive cargoes. Basic uses for gas are automobile fuel and aviation fuel. The last cargo, to be transported by us, was Molasses which is a sugar derivative used in making drugs, syrup, and soda. Molasses was the least dangerous cargo that we carried but it could be highly explosive if the right conditions existed. Molasses is an example of a product that is susceptible to spontaneous combustion. This concludes the list of cargoes I dealt with and what all those techniques were being used on.

[4]

Finally, the question of supervision. There was none once I became good at my job. That was about two months time. The reason for the lack of supervision is that as a tankerman I am supposed to know what to do and be responsible for my actions without having to be watched. I am the supervisor of the loading and

unloading operations. My tankermans license gives me this authority. I, in fact, directed two other men in these operations. If I made a mistake, I answered for it (whether it be the captain or the Coast Guard). Fortunately, there were no mistakes made.

Conclusion.

What did I achieve?

I gained insight into the merchant marine industry and marine transportation and I got a practical education that combined with my academic education will make me a more understanding individual of marine affairs. My personal objectives were easily satisfied due to the risks and traveling I did. Finally, the greatest accomplishment is that I obtained a Tankermans Certificate which is a certification of my proficiency in tanker operations. This means I learned the skills and techniques well. When I first started on the job I knew nothing but, by learning the skills and studying the Tankermans Manual, I acquired the know how needed to obtain the license. Therefore, I feel I am a better individual for having wanted to do it and having done it.

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THE END

As a brief but grateful thanks, I would like to acknowledge the crew of the Francis S. Bushey for their invaluable service and help in this venture. My most sincere thanks to them.

Appendix.

1) M/T Francis S. Bushey (U.S. flag), American registry # 269146, owned by Spentonbush Fuel Transport Inc., maximum cargo capacity: 21,500 barrels (or 900,000 gallons).

2) Shown below is an example of the Seaman's Papers issued by the United States Coast Guard.

U.S. MERCHANT MARINER'S DOCUMENT					
		NAME Bjorn Robertstad AUNE			
		Z OR BK NUMBER		DATE OF BIRTH 10-4-58	
		PLACE OF BIRTH New York		CITIZENSHIP USA	
		HOME ADDRESS Seagate Road Staten Island, N.Y. 10305			
SIGNATURE OF MARINER <i>Bjorn R. Aune</i>					
DATE NATURALIZED		NATURALIZATION No.		DATE FIRST PAPERS	
-		-		-	
HEIGHT		WEIGHT		COMPLEXION	
5'10 1/2"		150		Fair	
COLOR HAIR		COLOR EYES		SOCIAL SECURITY No.	
Brown		Blue		-	
ISSUED BY U. S. COAST GUARD					
AT New York, N. Y.					
ON 2-8-77 FOR					
ORDINARY SEAMAN					
WIPER					
STEWARD'S DEPARTMENT (FH)					
		SIGNATURE OF ISSUING OFFICER <i>[Signature]</i>			
		BY direction of OCMI TITLE			

3) The company that helped me was:

Spentonbush/Red Star Companies,
Spentonbush Fuel Transport Inc.
500 Fifth Avenue
New York, New York
10001

4) The Tankermans Certificate involved studying two texts issued by the United States Coast Guard (and other marine related agencies) that teach you about the behavior of petroleum and chemical products. Included in the texts are firefighting procedures and safety procedures. You are also instructed in proper handling procedures of these products. Combined with the practical experience and familiarity of tankers, you are issued the Tankermans Certificate (dependent upon successful completion of the examination given by the Coast Guard). The exam is given whenever you feel you are ready. The exam is a written examination on the behavioral aspects and firefighting procedures. You demonstrate your practical experience by the discharge papers received from service on the vessel.

5) The Tankermans Manual is available for free from the United States Coast Guard upon presentation of license or letter from company asking that they give you a manual. The manual is basically a periodical that is updated every year as more knowledge about petroleum and chemical products is known. See included manual for more information.

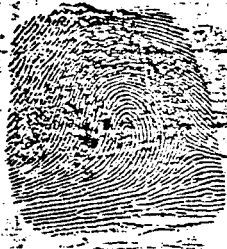
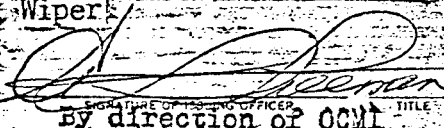
6) The Francis S. Bushey had 1,400 feet of lines and 81 valves to be regulated. Being that the Francis S. Bushey is old (1955), all the valves must be regulated by hand. This called for two men; one to regulate valves and the other to observe the cargo and direct the regulation of the valves in conjunction with whatever phase of the operation was involved.

7) The synchronized cutting in of the smaller line and shut down of the big line is a technique that will vary among tankerman as each has their own prescribed method and timing. Since there is no specific way of doing this, the tankerman is free to do it as he finds most convenient in facilitating the operation. This technique must, of course, be within the limits of safe procedures.

8) Punishable offenses refers to the repercussions, such as fines, imprisonment, or revocation of license, for acts of contamination on the seas surrounding the United States. The Coast Guard is the enforcement agency of the laws pertaining to pollution. An example of a statute against pollution is the contiguous zone pollution statute, which prohibits the discharge of anything upon the waters that will cause a discoloration, emulsion, slick, or sheen on the seas. Anybody who does this is subject to a \$5,000.00 fine or years' imprison-

ment, or both. This is an easy statute compared to others which can suspend or revoke your license permanently.

9) Shown below is the Tankerman's Certificate. It is the same license as shown previously except for the endorsement of Tankerman. Though it seems like little, it gives the individual a large authority and responsibility.

DATE NATURALIZED		NATURALIZATION No.	DATE FIRST PAPERS		ALIEN REGISTRATION No.
HEIGHT	WEIGHT	COMPLEXION	COLOR HAIR	COLOR EYES	SOCIAL SECURITY No.
5'10 1/2"	150	Fair	Brown	Blue	
ISSUED BY U.S. COAST GUARD					
AT New York, N. Y.					
ON 2-8-77 FOR					
Tankerman Grade A, and all lower grades					
Steward's Department (FH)					
Wiper					
					
					
BY direction of OCMI TITLE					